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CRAIN, CATON & JAMES
FIVE HOUSTON CENTER
1401 MCKINNEY, 17TH FLOOR
HOUSTON, TX 77010

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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YIN L. CHEUNG, MICHAEL J. ZEITLIN,
and MARK ACOSTA

Appeal 2009-013338
Application 10/806,980
Technology Center 2600

Oral Hearing Held: July 14, 2010

Before KENNETH W. HAIRSTON, MAHSHID D. SAADAT, and BRADLEY W. BAUMEISTER, *Administrative Patent Judges.*

APPEARANCES:

ON BEHALF OF THE APPELLANT:

WILLIAM P. JENSEN, ESQUIRE
Crain, Caton, & James
1401 McKinney Street
Seventeenth Floor
Five Houston Center
Houston, Texas 77010-4035
(713) 658-2323

The above-entitled matter came on for hearing on Wednesday, July 14, 2010, commencing at 9:05 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Janice Salas, Notary Public.

THE CLERK: Calendar number 7, appeal number 2009-013338, Mr. Jensen.

JUDGE HAIRSTON: Thank you.

Good morning, Mr. Jensen.

MR. JENSEN: Good morning.

JUDGE HAIRSTON: Do you have your business card --

MR. JENSEN: Yes, sir.

JUDGE HAIRSTON: -- for the record.

Spell your name for the record correctly.

MR. JENSEN: William Jensen.

JUDGE HAIRSTON: No. I mean, your business card, if you have it, so she can make sure get it correct.

MR. JENSEN: There you go.

JUDGE HAIRSTON: Thank you.

MR. JENSEN: Again, my name is Bill Jensen. I'm representing the Applicants this morning. I'm from the firm of Crain, Caton, and James in Houston, Texas.

Before I begin, I've got a presentation that sort of summarizes our arguments that I think will help in understanding of the invention and the prior art better since it's a lot -- mostly related to the visual arts. My concern is I've taken a trial run or two, and I think it takes about 20 minutes with the

anticipated questions. I might run over, and I understand we have to ask for time -- extra time up-front.

JUDGE HAIRSTON: Okay. That's fine. Go ahead.

MR. JENSEN: I think the most logical starting point is with the interview that was conducted on May 25th where an agreement was reached with the examiner concerning some amendments to clarify --

JUDGE HAIRSTON: May 25th of this year?

MR. JENSEN: May 25th of 2007.

JUDGE HAIRSTON: Oh, okay. We have a rocket docket here.

MR. JENSEN: I understand. I'm familiar. This is a copy of the interview summary. The agreement that was reached is pertaining to the clarification of real time. The Examiner made some suggestion -- proposed some suggested language, as you see here, for sufficiently fast to be perceived in real time as the three-D probe is moved or substantially at the same time as the three-D sampling probe is moved.

The claims were being rejected over a reference called Holden, which is a user manual for some software called VoxelGeo in the market.

JUDGE HAIRSTON: Does your spec make clear what's sub -- what are the parameters of substantially? How much time is involved, substantially at the same time?

MR. JENSEN: Well, the description basically says that it -- it ties it into interactive, meaning that it's being visualized or rendered at the same time as it's being moved, so it all really boils back down to the real time reference that the Examiner's pointed to here in the agreement that was reached.

JUDGE HAIRSTON: Okay.

MR. JENSEN: The Examiner had represented that the rejections be withdrawn and the claims allowed if there was no other reference for the related references that were found after a search was conducted. The next event -- well, the next event that took place is we amended the claims exactly as the Examiner suggested, as you can see by the -- this is an exemplary claim wherein the amendments were entered.

The underlining represents the proposed language by the Examiner to provide clarification of the operation of the sampling probe, and this, again, is an exemplary claim where claim 1 includes this limitation and claim 27 is an alternative of that showing sufficiently fast to be perceived in real time as the three-D sampling probe is moved.

Backing up to the first step, what's happening here is that the sampling probe in the first step is created and the sampling probe is a subset or a subvolume of a larger three-D volume data set.

The three-D volume data set will typically represent seismic data that may comprise a set of voxels, which are data points representing a point of data, a fixed point, with X, Y, Z coordinates and a data value.

So what happens is the seismic data is typically shot into the earth. The reflection bounces back, and the reflection is measured, for example, in terms of the amplitude. The amplitude is represented as a voxel at that particular point of reflection, and the data value represents the strength of the amplitude reflection, which is a range of data values from zero to 256, for example, and the data value can be represented as a color corresponding to the amplitude and the strength of the reflection.

The next step that's performed is the drawing of the image of the three-D sampling probe. The image is basically an intersection of the probe and the

larger three-D volume data set. The drawing, as the description refers to, is typically done by either texture mapping the intersection of the seismic data on the surfaces, the visible surfaces of the sampling probe, or the volume rendering it where it's rendered both on the surfaces and throughout the interior of the sampling probe.

And then I think what's at the heart of the disagreement with the Examiner is the next step, the repeating the drawing step responsive to movement of the three-D sampling probe within the three-D volume, so that as the three-D sampling probe moves through the volume, the image of the sampling probe is redrawn in one of these two manners.

So basically what's happening is that when you have the sampling probe drawn with that intersection and you want to move it to another point in the three-D volume, then the user is enabled to see the data changing on those surfaces of the sampling probe as it's being moved from one point in the volume to another point.

So, for example, if the user wanted to track a fault that's represented by the seismic data, and the user is typically referred to as an interpreter of the seismic data, the user positions the sampling probe in an area where he thinks that the fault occurs and then he intuitively can move the sampling probe through that larger data set, tracking the fault in real time to see exactly where the parameters are on that fault.

This is a significant advancement over the technology at this time, as I'll get into later when we compare it to the Holden reference. The next event that took place, rather surprising I guess, is that the Examiner rejected in a final rejection claims after we amended them exactly as he had suggested.

JUDGE HAIRSTON: So he didn't suggest that -- to clarify, you thought he was suggesting it to get it allowed as opposed to he maybe needed the clarification --

MR. JENSEN: The Examiner said that if these amendments are entered, then he would withdraw the rejections and allow the claims if there wasn't a further search that yielded any other related reference. Well, there was no other related reference. It was the same reference that we amended to overcome.

JUDGE HAIRSTON: Okay. He changed his mind.

MR. JENSEN: Exactly. I'm not sure why, but that's what happened.

JUDGE HAIRSTON: Okay.

MR. JENSEN: The Examiner's final rejection -- you don't see it here. You see sort of the overflow from page 2, but he still concedes that the Holden reference does not teach the limitations that were added by amendment. He takes the rest of page 3 to argue that his understanding suggests that those missing limitations for Holden are rendered obvious through some interpretation of Holden, which we argue is a misinterpretation.

His analysis not only misinterprets Holden, but, in our opinion, overlooks the teachings away of Holden from the claimed invention. It also fails to provide an explicit analysis in support of the legal conclusions, which are necessary to require an understanding of the level of ordinary skill in the art. The Examiner also never went into any analysis of the grant factors that include significantly the level of ordinary skill in the art, which would be, in our opinion, quite necessary to uphold any kind of analysis that you see on page 3 to suggest that the missing limitations are somehow suggested or motivated to be filled in with this Holden reference.

The Examiner then -- of the two pages in Holden that the Examiner relies on in the final rejection, he refers to language on page 6-4 -- and stop me if you'd like to see any of these references because I can move to the laptop and it's hyperlinked and I can show you what's on 6-4, but as quoted, he's relying on this language: More complex volumes require more time to render, which the reference does state, but it concludes without any further analysis or reasoning or support that this is obvious due to reduction of processed data.

Now, the Examiner never explains the level of knowledge possessed by one having ordinary skill in the art and why that person would arrive at the claimed invention just because a reduction of processed data might lead to improved processing time.

And again, this is a necessary component, in our opinion, to be able to understand what that person of ordinary skill in the art at the time of the invention would have understood and perceived in terms of what a reduction in processed data means, and the Examiner's argument is almost akin to saying superconductors aren't patentable simply because reducing resistance leads to improved conductivity.

Notably, our claims didn't claim improved or faster processing. They claimed a specific operation of the sampling probe to enable it to be redrawn as it's being moved. Now, the section that the Examiner refers to is called Tumbleview in chapter 6, and as it's described as a fixed volume in space that allows the viewpoint or perspective of the user to change with respect to the same volume.

There's nothing that's being redrawn, much less in response to movement of the sampling probe, through the three-D volume from point to point. In

other words, the description talks about a whole data set, not a subset of that, in most parts in allowing the viewer's perspective to be changed with respect to the same data set or the same volume of date.

Now, it does reference in some parts subsetting that into a subvolume, but, again, the user is looking at the same subvolume, and it's not being redrawn as it's being moved because the user's looking at different perspectives of the same data set, so even if the same volume were rotated instead of changing the perspective of the user, it wouldn't be redrawn as claimed. It would still be looking at the same data set as it's being rotated in the three-D volume.

What happens, then, is if you try and convert that into what the limitations require, then you would not be looking at a different perspective of the same data set. You'd be looking at each rotation -- and it's described as tumbling, which means rotating along a particular X, Y, or Z axis.

So if you were to change the data set as it moves or rotates around that axis, you'd never see the same data set from a different viewpoint, which is required, and that's why trying to change this feature of Tumbleview into what the claims require would render it inoperable or unsatisfactory for view -- for viewing different perspectives of the same volume.

JUDGE SAADAT: Counsel, I have a question.

MR. JENSEN: Yes, Your Honor.

JUDGE SAADAT: In the repeating step of claim 1, how the data set changes as you're suggesting that --

MR. JENSEN: That's a good question.

It's hard to perceive without actually having a sample of the software up and running, but I'll try and explain it. There's a large data set of three-D data,

typically seismic data. It's subsetted as -- well, it's subsetted by use of the sampling probe.

So when the sampling probe enters this three-D volume, the intersection of the sampling probe visible planar surfaces show the seismic data from that three-D volume just on those planar surfaces.

When you move the sampling probe from one position to the other, then the data in the three-D volume doesn't change. It's the data that appears on the sampling probe that changes.

JUDGE SAADAT: It's like getting different cross sections.

MR. JENSEN: Exactly.

JUDGE SAADAT: So that's what you're referring to as a new data set when the sampling probe --

MR. JENSEN: Well, by operation -- by operation of our invention, yes, that's what's happening when you move the sampling probe from one position or location to another. You have new intersections of the sampling probe within that larger three-D volume data set.

Does that address your question?

JUDGE SAADAT: It does, but I'm not sure what part of the claim defines that data set versus the data set that changes.

MR. JENSEN: Well, if you go back to the claim, this is -- where it's drawn as an image it shows -- it's comprising an intersection of the three-D sampling probe and the three-D volume. As it's being moved in this step, the drawing step is repeated.

The movement of the sampling probe from one position to the other is going to place it at a point where the intersection is going to be different than it was before, so by -- inherently, you're going to have different data

intersecting the sampling probe from the three-D volume simply by moving it from one position or location to another.

JUDGE SAADAT: So that's the -- the three-D -- the redrawn image of the sampling probe is the new data set that changes --

MR. JENSEN: Correct.

JUDGE SAADAT: -- all the time.

MR. JENSEN: Exactly. Well, it's not a new data set in terms of what the three-D volume represents, but it's different in new data compared to where the sampling probe was before.

JUDGE SAADAT: As far as the drawing goes.

MR. JENSEN: The intersection, right. Exactly.

The next section that the -- or chapter in Holden that the Examiner relies on describes GeoSeed on page 8-16. The Examiner erroneously concludes that the claimed sampling probe is equivalent to GeoSeed. In rejecting claim 16 in the final office action on page 7, the Examiner admits that a voxel is equivalent to a seed point, which is equivalent to GeoSeed.

And that's correct. The Examiner, I don't know how, but misinterprets what the voxel in GeoSeed is doing. It's permitting selecting a seed voxel within a feature of interest and detects other voxels that are adjacent to the seed voxel or any other detected voxel, and then it includes anything that falls within a user-defined range of voxel values.

So contrary to the Examiner, the GeoSeed isn't equivalent to the claimed sampling probe, which is a subvolume. The Examiner also concludes that since Holden's disclosure of movement of GeoSeed is always associated with input from a user, drawing is always associated with providing

perception to a user and concurrency is always described as sufficiently fast to be perceived as real time, the redrawing steps are equivalent.

I have to admit I had to read that probably about 10 times before I could fully appreciate or try and appreciate what it is the Examiner's getting at, and nowhere in GeoSeed did I see any reference to concurrency, sufficiently fast, or real time.

Notably, there's no -- there's no specific analysis or reasoning that supports this sort of string of conclusions that the Examiner presents, and one of the things that's significant that's threaded throughout this entire history of prosecution is that the Examiner in these legal conclusions never provides a sufficient or adequate analysis to support them.

In KSR, they quote Kahn, a federal circuit case, that rejections on obviousness grounds cannot be sustained by mere conclusory statements. Instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

And here I think it's clear that he hasn't met that standard, and even giving the Examiner the benefit of the doubt, GeoSeed teaches away from the claimed invention, so even if you were to convert somehow this fixed point representing the voxel into a sampling probe, which is a subvolume, the purpose of GeoSeed would be rendered inoperable simply because the GeoSeed detection algorithm takes these -- a seed point.

If I give you an example, the interpreter would take a seed point, say, for example, that lies on a fault represented by the seismic data, and that interpreter wants to see where that fault propagates throughout the larger three-D data set.

So he takes that seed. He knows where it is -- he knows that seed lies within a fault, so he knows that now, using this GeoSeed detection algorithm, that mostly likely, when he engages it, he's going to find other voxels that are connected to that one representing the fault, and he can then kind of interpret where the fault path flows.

So now, taking GeoSeed and trying to then morph it into a sampling probe that moves throughout the three-D volume would render it inoperable. I mean, you -- what GeoSeed detection algorithm relies on is the fact that you've got these fixed points that don't move. If you moved a voxel from one point to another, we'd never then represent the reflection of that seismic sound reflecting off it at that particular point with that particular data value.

The Examiner then moves on in his answer to a chapter that pertains to editing the volume.

The -- this particular chapter teaches that the image of the subvolume is redrawn in the rendering window after it is moved, not as it's moved. And I don't know if the Board has a copy of 9-22 at hand.

If it doesn't, I can pull it up on the screen for you.

JUDGE HAIRSTON: We have it.

MR. JENSEN: So as you see, looking at --

I'm sorry. 9-21. I think 9-21. The description as its operation is on 9-22, but 9-21 shows you the user interface. You've got two slider bars. The user selects an axis that they want to edit along, X, Y, or Z. The slider bar basically edits the volume in that right window, and it -- one slider will edit it from one side of the plane.

The other slider edits from the other side of the plane, and through this process, an interpreter or user can then edit the size of that subvolume within

the larger three-D volume data set. Significantly, though, that editing doesn't occur in the rendering window, which is the left window, until the slider bars are released.

Now, if you were to take that subvolume and move it from one point in that three-D data set to another point, you'd have to edit each one of those planar surfaces along the X, Y, and Z axis using the slider bars, and you'd have to move it from one point to another.

So that basically you would take one plane that shows in the right window, move it to that other position, size it, take another plane, move it to that, size it, and then the final axis, move it to that plane, and size it, and then you'd have a new, basically, subvolume at a different location in the three-D data set showing the intersection.

The Examiner never explains or supports why redrawing the Holden subvolume in this manner in the rendering window, which is the left window, after it's moved is equivalent to rendering the claimed sampling probe as it is moved, and contrary to the Examiner's answer on page 11, Applicants never concurred that the claim phrase -- the three-D sampling probe moves through the three-D volume -- is a change in the shape, size, or location of the three-D probe within the three-D volume.

The Appellant's Brief on page 18 refers to paragraph 52 of the application which describes a change in the shape, size, or location of the sampling probe within the three-D volume. So movement of the subvolume within the three-D volume is not the same as movement of the sampling probe through the three-D volume to another location.

These are different limitations in the same claim that further distinguish the Holden editing features in chapter 9 from the claimed invention.

There are other dependent claims that I think the Examiner overlooked that discuss reshaping the sampling probe, like in claim 2, or reorienting the sampling probe, like in claim 5, and the distinction is further highlighted by the description. These steps -- these are additional steps in the dependent claims apart from the movement through the three-D volume, which is from location to location.

The significant disadvantage here from Holden's operation is that if you take Holden and you want to move it from point A to point B in the three-D volume and then back to point A, all that the interpreter is going to see is with the intersection at point A and point B and then back at point A. There's never going to be any intuitive response to see what's going on between points A and B and back between B and A.

With the claimed invention, the user intuitively sees everything that happens, as the probe, sampling probe, is being redrawn between points A and B and then back between B to A, so if there was a fault, for example, that the interpreter was trying to track using Holden's subvolume in this chapter, he would have to know basically through an educated guess that it starts here.

Then he would have to make another guess that maybe it moves over here, and then if that's wrong, he has to guess again and keep doing this through the process of elimination to find exactly where the path of that fault propagates through the three-D volume data set.

With the claimed invention, the user simply moves it in the direction that they think, and if it's not in one direction, they can immediately move to another direction and see the data change and pick up a fault intuitively along that path that it propagates.

The other advantage is that the user might pick up on another feature of interest, for example, a salt bill (phonetic), that might intersect that fault and just perchance using Holden's technique, might stumble on it just by guessing at point B that there's some other feature of interest.

So this invention is a significant improvement over the prior art because it really enables an efficient -- an increased -- significantly increased efficiency level of using a subvolume to track features of interest in real time through the three-D data set and provide intuitive responses to an interpreter.

The Examiner then falls back on chapter 5, which I think is probably the furthest removed from what's going on with the claimed invention.

This chapter describes parameter settings. The parameters that it refers to are described as opacity, contrast, or color, for example.

Now, in our application, we also talk about these, but not necessarily in terms of parameters, but as, I think, attributes or characteristics.

So back to the data value that the voxel includes, for example, amplitude. This data value of amplitude will have, depending on the reflection strength, some range of values between zero and maybe 256. The representation of that change compared to a voxel, say, sitting next to it with a different reflection magnitude is represented in a number of ways. One of them could be the color.

So you might have a change in color depending on the magnitude of the data value or a change in contrast or opacity. So these are things that are related to the seismic data, but they're not necessarily -- well, they're not anywhere equivalent to a sampling probe. So the adjusting of these parameters simply don't or aren't equivalent to the sampling probe and how it moves throughout this three-D volume data set.

The adjusting of the rendering parameters is also subject to the same limitations or restrictions as the editing feature that we talked about with respect to chapter 9. So if you look at page 5-9 of Holden, I think depicts a representation of the parameter editing features.

And there's also a slider bar and there's also a window for the numerical value.

So you can take the slider bar, move it, and see the numerical value of the -- of the data value changing for that parameter between zero and say 256.

And then when you let go of the slider bar -- this is the same as chapter 9 -- then it renders the changed parameter, but, again, the significant difference is their parameter isn't a sampling probe.

And the Holden reference -- the Examiner goes into this double buffer feature which is simply taking the rendering step, the drawing, and doing it all at once in the

background, so that then when you move or adjust the parameter by moving the slider bar, you can see that changing as you move it, but there's no redrawing.

The drawing step has already been done in the background all at once before you move the slider bar so that it's -- and I think it's described in chapter 5 as sort of an animation technique, so all of the rendering of the drawing has to be done in the background before you go through and try and analyze the data used in this adjustment.

JUDGE SAADAT: Okay. Another question. If the sliding bar is not touched, what would be rendered?

MR. JENSEN: Nothing. There's no activity in either this chapter 5 or chapter 9 editing the subvolume unless you move the slider bar. I mean, I

guess there's a default that probably pulls up the subvolume at a predetermined location within the three-D volume and you see that.

JUDGE SAADAT: So a slide bar has a range, let's say zero to 50.

MR. JENSEN: Right.

JUDGE SAADAT: Or the number you mentioned. At zero -- that's a setting -- what would be displayed?

MR. JENSEN: Well, are you talking about this chapter or chapter 9?

JUDGE SAADAT: Chapter 9.

MR. JENSEN: Chapter 9.

JUDGE SAADAT: Yes.

MR. JENSEN: Okay. Well, the slider bar, if you recall, in chapter 9 adjusts the sides of the plane in either the X, Y, or Z axis. So if one slider is set to zero, I suspect that's going to represent one extreme of the plane.

JUDGE SAADAT: Right. So some type of cross section would be displayed, so I'm not convinced that the sliding bar is really relevant to displaying some image that is selected based on the sampling probe.

MR. JENSEN: Well, I --

JUDGE SAADAT: It just adjusts the way that that image could be modified or a particular aspect of it.

MR. JENSEN: Well, that's -- that's our position. Somehow the Examiner has gotten caught up that that's somehow equivalent or suggests moving the subvolume from one location to another and showing the intersection changes as it's being moved from one location to another, but that's not what's happening with the movement of the slider bar in chapter 9, as I think that you've just suggested.

It's an editing feature that, for primary purposes, resizes the subvolume, but it could be used to move it from one location to another, but, like I said or described earlier, you would have to -- you would have to take the slider bar, pick an axis, choose the size of the subvolume in the new location, and then go through that process iteratively through the three planes.

And it's not going to even render until you're through with that whole process, so you'll never see what's happening in between that first location and the next location. Does that help?

JUDGE SAADAT: It does. And also, why claim 1 doesn't have the term real time? What's the difference? There is a difference. I'd like to know your explanation.

MR. JENSEN: If I may go back to the exemplary claim.

Well, the thinking at the time was to follow what the Examiner's suggestion was. He made the proposal of these two alternatives because their different sets of claims include one limitation or the other as you see highlighted.

And aside from thinking that we had an agreement that would satisfy the Examiner and we would overcome this reference, I think all I can say for the record is that they include different -- different degrees of being able to see the sampling probe move through the three-D volume.

One may not be exactly in real time, but is being redrawn as its being moved. So I think the common denominator is that it's being redrawn as its being moved.

Are there any further questions?

JUDGE HAIRSTON: Any other questions?

JUDGE SAADAT: I don't have any.

MR. JENSEN: In conclusion, the Examiner admits that Holden doesn't teach the limitations that were added during the agreement. Tumbleview and the GeoSeed features not only fail to provide the motivation to modify Holden, but they also teach away from the limitations, and the rest of Holden relied on by the examiner is neither equivalent to those limitations nor sufficient to prove the obviousness by a preponderance of the evidence. The Applicants respectfully request that you reverse the Examiner's rejection of claims 1 through 52.

JUDGE HAIRSTON: Okay. Thank you, counsel.

Whereupon, the proceedings at 9:39 a.m. were concluded.